



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/248,103	02/11/1999	TADAO NAKAZAWA	614.1921/PIK	8397

21171 7590 12/19/2002

STAAS & HALSEY LLP  
700 11TH STREET, NW  
SUITE 500  
WASHINGTON, DC 20001

EXAMINER

BELLO, AGUSTIN

ART UNIT PAPER NUMBER

2633

DATE MAILED: 12/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/248,103

Applicant(s)

NAKAZAWA ET AL.

Examiner

Agustin Bello

Art Unit

2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 October 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-89 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-89 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) ☐ All b) ☐ Some \* c) ☐ None of:  
 1. ☐ Certified copies of the priority documents have been received.  
 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
 \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_                      6) ☐ Other: \_\_\_\_\_

Art Unit: 2633

## DETAILED ACTION

### *Response to Request for Reconsideration*

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-15, 18-22, 25-32, 35-59, 62-68, and 71-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gaudino's article "A Novel AOTF-Based Multichannel Add-Drop Node and its Cascadability in WDM Ring Networks" in view of Thompson (U.S. Patent No. 6,031,852).

Regarding Claims 1, 3, 4, 6-9, 35-36, 39-40, 43-45, 48-50, 59, 78, 79, 80, 86, 87, 88, 89, Gaudino teaches an apparatus comprising: first and second acousto-optical tunable filters (AOTF) cascaded together so that the second filter filters light output from the first filter (see Figure 1), the first and second filters having filtering characteristics controlled in accordance RF signals applied thereto (as noted by Gaudino in the last paragraph of page 77). Gaudino differs from the claimed invention in that Gaudino fails to specifically teach that the phase of a beat generated by the RF signals applied to the first optical filter is different than a phase of a beat generated by the RF signals applied to the second optical filter. However, Thompson, in the same field of endeavor, teaches it is well known in the art to change the phase of the RF signal input to a pair of cascaded AOTFs, thereby inherently teaching that the beats produced in each of

Art Unit: 2633

the filters have different phases (column 6 lines 2-13). Thompson teaches that the doing so provides higher efficiency over a wide range of acoustic frequencies and deflection angles. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have allowed the phase of a beat generated by the RF signals applied to the first optical filter to be different than a phase of a beat generated by the RF signals applied to the second optical filter in order to increase efficiency over a wide range of acoustic frequencies and deflection angles.

Regarding Claims 2, 5, 37, 41, the combination of Gaudino and Thompson would have suggested to one skilled in the art that it would have been beneficial to have allowed the phase of a beat generated by the RF signals applied to the first optical filter to be different than a phase of a beat generated by the RF signals applied to the second optical filter in order to increase efficiency over a wide range of acoustic frequencies and deflection angles. Being that Thompson teaches an RF source that allows the phase of the input RF signal to be shifted, one skilled in the art would clearly have recognized that it would have been possible to adjust the phase difference between the beats created to any angle desired, including a value obtained by dividing  $180^\circ$ . Doing so would have involved only routine skill or experimentation for one skilled in the art. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have made the difference in the phase of the beats generated equal to any value desired.

Regarding Claims 10, 18, 53, 62, 64, the combination of Gaudino and Thompson teach cascading a first and second AOTF, and Gaudino further suggests that greater than two AOTFs could be cascaded (second paragraph of page 79). However, the combination of references fails to specifically teach a third AOTF cascaded with the first and second AOTFs for filtering the

Art Unit: 2633

second output light in accordance with RF signals applied to the third optical filter for controlling filtering characteristics of the third optical filter, wherein a phase of a beat generated by the RF signals applied to the first optical filter is different than a phase of a beat generated by the RF signals applied to the second optical filter and a phase of a beat generated by the RF signals applied to the third optical filter. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have cascaded a plurality of filters, thereby allowing each filter to extract a particular wavelength or group of wavelengths. One skilled in the art would have been motivated to cascade a third, fourth or fifth filter to filter the second output of the first filter in order to provide a higher degree of accuracy in the extraction of a particular wavelength or group of wavelengths by narrowing the filter passband of the third filter so that the output of the filter only included the desired wavelength or group of wavelengths. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have cascaded a third optical filter from the first optical filter wherein the third optical filter creates a beat with a phase that is different from the phase of the beat created by the first filter since doing so would have provided a more accurate filter as suggested by the teachings of the combination of Gaudino and Thompson and since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art, *St. Regis Paper Co. of v. Bemis Co., 193 USPQ*.

Regarding Claim 11, 54, 63, as discussed above, the combination of Gaudino and Thompson would have suggested to one skilled in the art that it would have been possible to select and desired phase difference for the beats generated by the RF signals applied to AOTFs, being that Thompson specifically teaches the ability and mechanism to adjust the phase of the input RF signal to the AOTF. Therefore, it would have been obvious to one skilled in the art at

Art Unit: 2633

the time the invention was made to have selected the phase between the beats generated by the RF signals to have had the same.

Regarding Claim 12-14, 19-21, 55-57, and 66-68, the combination of Gaudino and Thompson teach cascading a plurality of AOTFs, , the AOTFs being controllable by RF signals which select particular wavelengths from a light passing therethrough. One skilled in the art would clearly have recognized that it would have been possible to selected or reject any desired wavelength passing through the AOTF by selecting the appropriate RF signal. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to selected or rejected an desired wavelength in any of the cascaded filters by selection of the appropriate RF signal.

Regarding Claim 15, 22, Gaudino teaches the first output light excludes at least two wavelengths and the second output light from the first optical filter includes the selected wavelengths (see Figure 1).

Regarding Claim 25, 31, 71, 81, 84, 85, the combination of Gaudino and Thompson teach cascading a first and second AOTF, and Gaudino further suggests that greater that two AOTFs could be cascaded (second paragraph of page 79). Thompson also teaches a phase controller controlling the phase of the RF signal applies to the first and second optical filters (inherent in the RF generator of column 6 lines 2-13). However, the combination of references fails to specifically teach a third AOTF cascaded with the first and second AOTFs for filtering the second output light in accordance with RF signals applied to the third optical filter for controlling filtering characteristics of the third optical filter, wherein a phase of a beat generated by the RF signals applied to the first optical filter is different than a phase of a beat generated by the RF signals applied to the second optical filter and a phase of a beat generated by the RF

Art Unit: 2633

signals applied to the third optical filter. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have cascaded a plurality of filters, thereby allowing each filter to extract a particular wavelength or group of wavelengths. One skilled in the art would have been motivated to cascade a third, fourth or fifth filter to filter the second output of the first filter in order to provide a higher degree of accuracy in the extraction of a particular wavelength or group of wavelengths by narrowing the filter passband of the third filter so that the output of the filter only included the desired wavelength or group of wavelengths. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have cascaded a third optical filter from the first optical filter wherein the third optical filter creates a beat with a phase that is different from the phase of the beat created by the first filter since doing so would have provided a more accurate filter as suggested by the teachings of the combination of Gaudino and Thompson and since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art, *St. Regis Paper Co. of v. Bemis Co., 193 USPQ*.

Regarding Claim 26, 27, 32, 46, 51, 72, 73, 82, 83, the combination of Gaudino and Thompson teach a phase controller which controls the phases of the RF signals input to the AOTFs. One skilled in the art would clearly have recognized that it would have been possible to set the phase difference between the AOTFs to any desired difference including setting the phase difference to be the same for each AOTF.

Regarding Claim 28-30, 74-77, the combination of Gaudino and Thompson teach cascading a plurality of AOTFs, , the AOTFs being controllable by RF signals which select particular wavelengths from a light passing therethrough. One skilled in the art would clearly have recognized that it would have been possible to selected or reject any desired wavelength

Art Unit: 2633

passing through the AOTF by selecting the appropriate RF signal. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to select or reject an desired wavelength in any of the cascaded filters by selection of the appropriate RF signal.

Regarding Claim 38, 42, 47, 52, 58, 65, Gaudino teaches setting a first and second RF frequency to be the same (see Figure 1).

4. Claims 16, 17, 23, 24, 33, 34, 60, 61, 69, and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gaudino's article "A Novel AOTF-Based Multichannel Add-Drop Node and its Cascadability in WDM Ring Networks" in view of Thompson (U.S. Patent No. 6,031,852) and Cheung (U.S. Patent No. 4,906,064).

Regarding Claim 16, 23, 33, 60, 69, the combination of references differs from the claimed invention in that it fails to specifically teach that the cascaded AOTFs are formed on the same substrate and that a reflective element is incorporated onto the same substrate. However, one skilled in the art would clearly have recognized that incorporating a plurality of elements onto a single substrate would have reduced the size of the system and overall cost of producing the system. Cheung, in the same field of endeavor, teaches it is well known to cascade a plurality of AOTFs with a plurality of reflective devices in order to form a switching system wherein an optical signal filtered by a first AOTF is reflected to a third AOTF, while a signal transmitted by the first AOTF is filtered by a second AOTF. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have cascaded a plurality of AOTFs and reflective devices as taught by Cheung in order to create a switching system and to have produced these elements on the same substrate in order to reduce the size and cost of the system.



Art Unit: 2633

Regarding Claim 17, 24, 34, 61, 70, the combination of references and Cheung in particular teach that the filtered signals are prevented from being reflected back to the first optical filter being that the reflection of the signals is polarization dependent.

***Response to Arguments***

5. Applicant's arguments with respect to claims 1-89 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (703)308-1393. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703)305-4729. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9314 for regular communications and (703)872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

AB

December 10, 2002

  
JASON CHAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600